

EXHIBIT 5

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

WAYMO LLC,

Plaintiff,

vs.

Case No.

UBER TECHNOLOGIES, INC.;

3:17-cv-00939-WHA

OTTOMOTTO LLC; OTTO TRUCKING LLC,

Defendants.

_____ /

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

VIDEOTAPED DEPOSITION OF ANDREW WOLFE, Ph.D.

FRIDAY, AUGUST 11, 2017

Reported by:

Anrae Wimberley

CSR No. 7778

Job No. 2678828

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1 BY MS. YANG: 10:38:51

2 Q. The specification states, "Upon the diode 514 10:38:53

3 being reverse biased, the current through the 10:38:56

4 inductor 510 goes to zero and the voltage across the 10:39:01

5 inductor 510 settles at zero, which sets node A to the 10:39:07

6 voltage of the voltage source 502 (e.g., the voltage 10:39:11

7 V1), but the capacitor may hold a higher voltage 10:39:16

8 (e.g., about 2 V1)." 10:39:17

9 So matching that up against the curves shown 10:39:22

10 in Figure 5B, when the diode is reversed by T2, the 10:39:28

11 current through inductor 510, which is shown by the 10:39:32

12 curve IInd, it goes to zero; is that correct? 10:39:36

13 A. For this particular embodiment in this 10:39:38

14 particular example, that's true. 10:39:40

15 Q. And so in the '936 patent, it's describing -- 10:39:44

16 the '936 patent is describing an idealized diode, is 10:39:50

17 that correct, where there's no reverse current 10:39:54

18 described in the Figure 5B or in the specification; is 10:39:59

19 that true? 10:40:01

20 MR. NEWTON: Objection; form. 10:40:39

21 THE WITNESS: It's not clear. I guess 10:40:50

22 theoretically it's idealized, but what it's really 10:40:55

23 showing here is that the voltage at node A and the 10:40:58

24 voltage at the other side of the diode at this 10:41:02

25 particular period of time are so close, that there's 10:41:10

1 very, very little difference between them. 10:41:12

2 So when it tells us that it's reverse 10:41:15

3 biased -- if, for example, we were to look at the 10:41:22

4 figure that I have on page 18, it's telling us here 10:41:28

5 that it's just a tiny bit to the left of the axis line 10:41:34

6 into the blue region. 10:41:38

7 So if we were to be hypertechnical about it, 10:41:40

8 there would be a very, very small reverse current, but 10:41:51

9 it's right up against the point where it would be 10:41:54

10 zero. So -- 10:41:57

11 BY MS. YANG:

12 Q. Well -- 10:41:58

13 A. The words "reverse biased" tell us that it 10:42:01

14 exists, but we're right up against the null point in 10:42:06

15 that particular situation that's being described 10:42:09

16 there. So the current is about close to zero as 10:42:12

17 anybody would care about. 10:42:14

18 Q. And earlier today, an hour ago, we talked 10:42:18

19 about the curve IInd in Figure 5B. And at least as 10:42:22

20 illustrated in Figure 5B, the curve at T2 goes to zero 10:42:28

21 and stays at zero until at least about the point TRx 10:42:33

22 in this figure; is that correct? 10:42:36

23 MR. NEWTON: Objection; form. 10:42:50

24 THE WITNESS: Yeah, at least close enough to zero 10:42:52

25 that nobody would care about it. It would not stay at 10:42:55

1 zero. There are other leakage currents in the 10:42:58
2 circuit. There's leakage in the capacitor and other 10:43:01
3 kinds of things. But it's -- for that short period of 10:43:02
4 time, it's close enough to zero that nobody really 10:43:05
5 cares to measure or model the difference. 10:43:09

6 BY MS. YANG:

7 Q. So there's no -- at least no one is 10:43:13
8 illustrating any type of reverse current for the curve 10:43:16
9 IInd on Figure 5B; is that correct? 10:43:21

10 A. That's correct. In this one particular 10:43:27
11 example, it would be small enough that, for that 10:43:30
12 particular period of time, which, again, is the time 10:43:32
13 it takes -- it's quite literally the speed of light. 10:43:36
14 Right. It's the time it takes light to go out 10:43:40
15 somewhere and bounce back. So we're talking about a 10:43:42
16 very short period of time. It's not significant in 10:43:44
17 this particular example. 10:43:46

18 Q. Let's just clear up the record. 10:43:50

19 When you say "the time it takes for light to 10:43:53
20 go out and bounce back," you're referring to light 10:43:56
21 emitting from the diode, goes out into the 10:43:58
22 environment, the LiDAR, bounces back off the 10:44:01
23 environment and returns to the LiDAR; is that correct? 10:44:02

24 A. Right. That's what Delta T is. 10:44:06

25 Q. I just wanted to clear up the record. 10:44:08

1 fire off a laser diode very quickly. 11:01:02

2 Q. If in the circuit 5A there is not a diode 11:01:06

3 present -- if we remove diode 514 from circuit 5A, 11:01:19

4 would the capacitor 516 be able to hold and maintain a 11:01:26

5 charge? 11:01:27

6 MR. NEWTON: Object to this question as outside 11:01:29

7 the scope. I don't think this relates to the 11:01:32

8 construction claim opinions that are in Dr. Wolfe's 11:01:35

9 report. 11:01:36

10 THE WITNESS: Yes. That's a characteristic of a 11:01:39

11 capacitor. But in this particular case, you've broken 11:01:42

12 the circuit by taking out a component. And because of 11:01:46

13 that, the charge that actually gets onto the capacitor 11:01:54

14 would have to come from somewhere else before it could 11:01:58

15 be held. 11:01:59

16 BY MS. YANG: 11:01:59

17 Q. I mean, if there's just a wire between 11:02:02

18 inductor 510 through where there would have been a 11:02:08

19 diode 514 leading into capacitor 516 and there's no 11:02:12

20 diode there at all, nothing becomes reverse biased 11:02:14

21 ever, is the capacitor able to be charged and hold a 11:02:21

22 charge higher than the voltage source V1? 11:02:26

23 MR. NEWTON: Same objection. This is outside the 11:02:29

24 scope of the claim construction opinions. 11:02:31

25 THE WITNESS: Sure, it can. Just would not hold 11:02:35

1 A. Um-hum. 12:03:29

2 Q. -- in the context of, say, the circuit 12:03:34

3 described in Figure 5A, when the diode is forward 12:03:39

4 biased and capacitor 516 is being charged, is the 12:03:47

5 effective resistance on that diode very, very small, 12:03:51

6 approaching zero? 12:03:53

7 A. Not necessarily. 12:03:54

8 Q. And why not? 12:03:57

9 A. Just there's nothing in the patent that tells 12:04:00

10 us that it needs to be that way. 12:04:03

11 Q. Does the patent describe any resistance value 12:04:07

12 for the diode 514? 12:04:10

13 A. No. It describes its function, which is to 12:04:13

14 conduct electricity. And it describes it as being an 12:04:17

15 ordinary diode. Ordinary diode is not going to be a 12:04:20

16 perfect conductor, so there's going to be some 12:04:23

17 resistance. But the specific value of the resistance 12:04:27

18 is not taught as something that's interesting to the 12:04:30

19 operation of this device. 12:04:32

20 An engineer would just choose a diode that 12:04:35

21 met the ordinary -- ordinary design characteristics 12:04:39

22 that he needed based on the total amount of power, 12:04:42

23 total amount of heat. 12:04:45

24 Q. I guess -- when you say, "a specific value of 12:04:52

25 the resistance is not taught as something that's 12:04:55

FEDERAL CERTIFICATE OF DEPOSITION OFFICER

I, ANRAE WIMBERLEY, CSR NO. 7778, do hereby
declare:

That, prior to being examined, the witness named
in the foregoing deposition was by me duly sworn
pursuant to Section 30(f)(1) of the Federal Rules of
Civil Procedure and the deposition is a true record of
the testimony given by the witness;

That said deposition was taken down by me in
shorthand at the time and place therein named and
thereafter reduced to text under my direction;

----- That the witness was requested to
review the transcript and make any changes to the
transcript as a result of that review pursuant to
Section 30(e) of the Federal Rules of Civil Procedure;

----- No changes have been provided by the
witness during the period allowed;

----- The changes made by the witness are
appended to the transcript;

----- No request was made that the transcript
be reviewed pursuant to Section 30(e) of the Federal
Rules of Civil Procedure.

I further declare that I have no interest in the
event of the action.

I declare under penalty of perjury under the laws
of the United States of America that the foregoing is
true and correct.

WITNESS my hand this 14th day of August, 2017.



ANRAE WIMBERLEY, CSR NO. 7778